

BT
a bypass valve fluidly connected to one of the at least two pistons to deactivate the one piston, wherein the piston to which the bypass valve is connected to has a surface area that is different than a surface area of the other piston of the at least two pistons.

sub c'
4. (Amended) A high pressure piston pump, comprising:

BZ
a housing having a low pressure fuel inlet and a high pressure fuel outlet;
three pistons disposed in the housing;
a driveshaft for supplying power to drive the at least two pistons; and
a bypass valve fluidly connected to at least one of the at least two pistons to deactivate the at least one piston, wherein the bypass valve is fluidly connected to only one of the three pistons, and wherein the piston to which the bypass valve is connected to has a surface area that is different than a surface area of the other pistons.

sub c'
5. (Twice Amended) A high pressure piston pump, comprising:

BZ
a housing having a low pressure fuel inlet and a high pressure fuel outlet;
at least two pistons disposed in the housing;
a driveshaft that drives the at least two pistons; and
a bypass valve fluidly connected to one of the at least two pistons to deactivate the one piston, wherein the piston to which the bypass valve is connected to has a surface area that is larger than a surface area of the other piston of the at least two pistons.

sub c'
33. (Amended) A method of varying the flow output of a high pressure piston pump having at least two pistons comprising:

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pumping fluid by a first piston of the at least two pistons, the first piston having a first surface area;

pumping fluid by a second piston of the at least two pistons, the second piston having a second surface area different from the first surface area; and

deactivating one of the at least two pistons wherein the one piston is deactivated by

directing fluid displaced by the one piston to a normally open bypass valve..

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34. (Amended) The method of claim 33 wherein the bypass valve directs the fluid to a low pressure area of the pump.

35. (Amended) The method of claim 33 wherein the fluid displaced by the at least one piston is fuel for the engine.

Sub C1
38. (Twice Amended) A high pressure fuel injection system, comprising:

a source of fuel;

a low pressure pump;

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a high pressure piston pump, the low pressure pump being disposed between the fuel source and the high pressure piston pump;

a fuel rail including a plurality of fuel injectors, the high pressure piston pump being disposed between the low pressure pump and the fuel rail; and

a fuel return line connecting the fuel rail to a low pressure side of the high pressure pump;

wherein the high pressure piston pump comprises a housing having a low pressure fuel inlet connected to an output of the low pressure pump, a high pressure fuel outlet connected to an input of the fuel rail, at least two pistons disposed in the housing, and a bypass valve fluidly connected to one of the at least two pistons to deactivate the one piston, and wherein the one piston to which the bypass valve is connected to has a surface area that is different than a surface area of the other piston of the at least two pistons.

Sub C1
45. (Amended) A high pressure fuel injection system, comprising:

a source of fuel;

a low pressure pump;

a high pressure piston pump, the low pressure pump being disposed between the fuel source and the high pressure piston pump;

a fuel rail including a plurality of fuel injectors, the high pressure piston pump being

disposed between the low pressure pump and the fuel rail; and
a fuel return line connecting the fuel rail to a low pressure side of the high pressure pump;
wherein the high pressure piston pump comprises a housing having a low pressure fuel inlet connected to an output of the low pressure pump, a high pressure fuel outlet connected to an input of the fuel rail, at least two pistons disposed in the housing, and a normally open bypass valve fluidly connected to one of the at least two pistons to deactivate the one piston.

48. (Amended) A high pressure piston pump, comprising:

a housing having a low pressure fuel inlet and a high pressure fuel outlet;
three pistons disposed in the housing;
a driveshaft that drives the at least two pistons; and
a bypass valve fluidly connected to at least one of the at least two pistons to deactivate the at least one piston, wherein the bypass valve is fluidly connected to only one of the three pistons, and wherein the piston to which the bypass valve is connected to has a surface area that is larger than a surface area of the other piston of the at least two pistons, and wherein the bypass valve includes a solenoid for opening and closing the bypass valve.